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Image restoration with fuzzy coefficient driven anisotropic diffusion

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Abstract

© Springer International Publishing Switzerland 2015. Nonlinear anisotropic diffusion is widely used in image processing and computer vision for various problems. One of the basic and important problem is that of restoring noisy images and diffusion filters are an important class of denoising methods. In this work, we proposed a fuzzy diffusion coefficient which takes into account local pixel variability for better denoising and selective smoothing of edges. By using smoothed gradients along with the fuzzy diffusion coefficient function we obtain edge preserving restoration of noisy images. Experimental results on standard test images and real medical data illustrate that the proposed fuzzy diffusion improves over traditional filters in terms of structural similarity and signal to noise ratio.

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Keywords

Anisotropic, Denoising, Diffusion coefficient, Fuzzy edge detection, Image restoration